

Know your wind

By RENA DELBRIDGE

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DOUGLAS -- Yes, the wind blows in Wyoming.

But high wind speeds as we feel them on the ground are probably not enough to indicate great potential for companies looking to develop wind resources.

Instead, they're after a capacity factor, a number given as a percentage, gathered through a complicated formula that considers wind frequency and variability, air density, a terrain roughness factor and more.

Shane Hansen, an air quality meteorologist for Intermountain Labs in Sheridan, explained these factors to an audience of mostly ranchers and landowners at the annual Ropin' the Wind renewable energy conference here, in conjunction with the Wyoming Winter Ag Expo.

The numbers, collected using anemometers on tall towers, give companies an idea of how profitable commercial development of wind resources will be on a given site, Hansen said. Just as importantly, they give savvy landowners the information they need to reach the best deal with developers, added Ed Werner, who organized the conference and is executive director of the Wyoming Wind Working Group.

Werner said that considering the investment in Wyoming's wind will likely hit billions of dollars in the coming years, anyone can benefit from learning more about the resource. But landowners who may be able to turn a profit from leasing acreage to companies have got to gather the knowledge.

"It's absolutely critical they understand these issues," Werner said. "This is what the developers are coming in with. If you want to get the maximum value, information is everything."

Most people seem to think that a steady wind is all that matters, Werner said. They're often surprised to find out how many other factors affect a developer's decision to site turbines.

Hansen discussed frequency, or when wind speeds are higher and lower than average; seasonal, even daily variability; the directional source of the greatest winds; and air density, a description of temperature and pressure that helps form a big picture of a site's generation potential.

"If you had the wind speed Wyoming has at sea level, you'd have turbines everywhere," Hansen said. But the higher elevation means lower air density, so blades don't spin as rapidly -- and less electricity is produced.

Among the top tools available to assess the potential of a particular site is a wind rose, a diagram with the site at the center and bars radiating out in proportion to the direction and frequency of wind.

“You’ve got to assess this, and you’ve got to know what’s going on season to season,” Hansen said.

Roughness of the landscape surrounding an anemometer is also important. The rougher the terrain, the greater the turbulence, he explained. Developers don’t want to worry about turbulent winds, which are tough on equipment and destructive to turbines.

Still, wind is probably Wyoming’s best developable resource, Hansen said, considering the data he’s evaluated from around the state. Case in point, he said, is PacifiCorp’s plan to install two 66-turbine, 99-megawatt wind projects at Glenrock, where wind readings are notoriously high in speed and frequency.

“Their wind speeds are phenomenal,” he said.

Intermountain Labs handles data under private contracts but also analyzes readings from anemometers loaned to landowners through the Wyoming Business Council. Because it is publicly funded, that data is public information. Companies can access the wind readings, but so can landowners --which gives them more playing power at the table.

“This isn’t just environmental feel-good stuff,” Werner said about wind as energy. “This is big business, with big money involved. I want to make sure landowners and the people of this state get their fair share.”

Even beyond the data, Hansen said, companies consider the proximity of a wind turbine site to transmission lines -- and whether those lines are close to capacity.